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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,821	03/24/2004	Jathan D. Edwards	1042US01	4332

7590 10/04/2007  
Attention: Eric D. Levinson  
Imation Corp.  
Legal Affairs  
P.O. Box 64898  
St. Paul, MN 55164-0898

EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

MAIL DATE	DELIVERY MODE
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10/04/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/807,821

Applicant(s)

EDWARDS ET AL.

Examiner

Marianne L. Padgett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10/7/2004 & 3/24/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/7/4.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

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1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-9, drawn to an apparatus with two reservoirs, a means for mixing the contents thereof & a nozzle for dispensing the mixture, with dependent claims directed towards various energy sources, which may be used to treat (cure) the dispensed mixture, classified in class 118, subclass 612, or 300+, or 641, or 621.
  - II. Claims 10-20, drawn to a process for fabricating a holographic data storage medium via mixing two components to create a formulation which is dispensed with a nozzle, with dependent claims directed to photocuring (UV), classified in class 427, subclass 512 or 162+, or 121.1+ (427.4).
2. This application contains claims directed to the following patentably distinct species:  
curing via (1) heating or heating means;  
(2) microwaves or microwave source; or  
(3) optical radiation & its source (includes photocuring & UV).

The species are independent or distinct because they are directed to completely different apparatus structures & provide energy to the curing operation in different forms (i.e. heat, microwaves or photons).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

Currently, 1-7, 10-17 & 20 generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic

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claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

3. The inventions are independent or distinct, each from the other because:

Inventions group II and group I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus may be employed to mixing & spray materials other than those used for a holographic formulation composition, as there are no features of the claimed reservoirs, mixer and nozzle which particularly limit the materials capable of being employed therewith. Furthermore, when particular substrate holding means are discussed in dependent claims designed to align to substrates for deposition between them, it is noted that other devices such as liquid crystal devices also employ opposing substrates with materials applied in between. With respect to curing means, photocuring (UV), microwave radiation & heating elements are conventionally employed for curing many different types of polymeric materials, as well is curing inorganic material, such as our sometimes referred to as green ceramics or the like.

4. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art due to their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

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Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

5. Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

6. During a telephone conversation with Kelly Fitzgerald (for Eric Levinson) on 7/11/2007 a provisional election was made with traverse to prosecute the invention of group II & the species of photocuring (optical radiation, UV), method claims 10-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of

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inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

8. The IDS of 10/7/2004 is made of record, and it is noted that none of the cited Japanese references actually supply any Japanese Patent Document, only English abstracts or the English translations were supplied, and for the translations, **no** figures were supplied to go with the translations discussion of figures, thus the references are clearly **incomplete**, besides lacking the original documentation.

9. Claims 10-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claim 10's preamble is not commensurate scope with the body of the claim, since no "storage medium" of any sort is necessarily made in the claimed steps of the process, neither one that is holographic or can store holographic images, to possible intended meanings.

The language of the body of claim 10, is also very cryptic, such that meanings tend to be unclear or ambiguous. For instance, the term "multi-chemistry" could mean quite a few different things, such as the possibility that the formulation can undergo more than one chemical reaction depending on (unspecified) conditions it is exposed to (i.e. that includes almost any composition), or meaning a composition that will have more than one reaction going on simultaneously for the same condition, or that the formulation is made up of several distinct chemical compounds, etc., such that this limitation is ambiguous, hence unclear scope.

Also in claim 10, the phrase "formulation using mixer comprising a first stage...first set of mixing elements..." can be considered ambiguous, as the "comprising" limitation could be directed towards elements (as in from the periodic table) being mixed or used in the formulation (i.e. composition) at different stages where their relative size is specified; or the "comprising" phrase could be describing an

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apparatus used for mixing (i.e. the mixer). In light of the specification, especially figure 5 & [0068-69] the latter option appears to be the intended meaning, however clarification of claim language to avoid confusion is desirable.

Use of relative terms, but lacked clear metes and bounds in the claims, or in a clear definition in the specification or relevant prior art, is vague and indefinite. In claim 14, see "reduced" modifying "adhesion", which is a relative term, as there is no baseline to determine from what value or in what way the adhesion was reduced, especially considering the claimed coating material of boron oxide, which is supposedly reducing adhesion a formulation to the nozzle, has no comparison to any other material in either the claim or the specification ([0067]), hence there is no way to tell from what it is reduced, especially considering one does not even have any idea what material the formulation is made of, so that any evaluation can be made with respect to any nozzle materials.

Claim 15 makes no sense to the examiner. How can one "hold the two substrates to within one optical fringe"? It sounds like a nonsense phrase. Also, with what is one "pre-aligning a cavity"? Where is this cavity?

Claim 16 has some similar language concerns, i.e. "within one optical fringe", but also it is unclear how some cavity at an unspecified location has any effect on the two substrates. It appears that clearer configurational relationships need to be expressed.

In claim 17, it is unclear to the examiner how "center" is intended to modify "dispensing", i.e. "center" of what?

In claim 18, "a write monomer" appears to be a typographical error, as the examiner knows of no such adjective for properly describing a polymer or chemical, but what it should be or what the use of "write" as an adjective for a monomer is supposed to mean is not evident. Also, it is unclear how a wavelength can be sensitive to any dye, usually it's the other way around, where a specified chemical will be sensitive to particular wavelengths of radiation.

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Claims 19 and 20 relate to the preamble, but have no clear relationship to the body of the claim, thus to the particular steps performed therein, hence it is unclear what is sealed in claim 19 & how either of "a hub" or "a center hole" relate to either the substrates or the formulation described in the actual process limitations.

10. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 14 in the scope written, and as discussed in section [0067] of the specification is directed to any form of boron oxide used on a dispensing nozzle being effective in reducing adhesion when compared to any other nozzle material for any "multi-chemistry holographic formulation" (which in itself is poorly defined), however no enablement for how one creates this miraculous reduction in the adhesion for all of a large set of formulations with respect to all other nozzle materials, nor how what does this regardless of the microstructure of the boron oxide. For these reasons sufficient enablement for this claim is considered lacking.

11. The patents to Edwards (et al.), PN 6,804,034 B2 & 7,034,971 B2 have method claims of interest with respect to the present claims as they are directed to procedures that appear to be related to the presently claimed method for fabricating holographic storage media, however neither set of claims has any limitations concerning the mixing procedure employed, such that at this time, there does not appear to be sufficient overlap to warrant double patenting rejections with respect to either case.

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 10-16 & 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colvin et al. (5,874,187), in view of King (6,027,241) or Boatman et al. (5,486,049).

Colvin et al. (abstract; figure 1; col. 3, lines 18-col. 4, line 18 +; col. 5, lines 49-60; and col. 6, line 42-col. 7, line 29; and example 1, starting col. 8, line 40) teach making holographic recording medium that sandwiches an oligomer & monomer photopolymeric solution between two substrates, then crosslinks the multifunctional oligomer *in situ* (called pre-curing) under conditions designed to leave a fraction of the mono-functional monomer unreacted (may be considered to be the "write" monomer). Colvin et al. note that while it is convenient for both the crosslinking of the matrix & the writing function of the product to use a single photoinitiator, alternatives include employing light of different wavelengths for the recording & the matrix crosslinking, which may permit efficient use of the monomer, avoid consumption of the monomer during matrix formation & increase contrast/sensitivity. While this teaching does not explicitly suggest the addition of a second component/photoinitiator to effect the possible two stages of photocuring, this alternative teaching would have been suggestive to want of ordinary skill in the art of photocuring to employ a second photosensitive material besides the photoinitiator for use with the monomer, where notice is taken that such photosensitizers employed for such purposes typically encompass dyes. Note, the solution employed can be considered to read on several possible meanings of applicants' "multi-chemistry holographic formulation". Colvin et al.

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provides discussion on adjusting the arrangement holding the two glass plates before and during filling a gap between the plates (substrates with the photopolymer composition, plus adjusting during the precure operation so as to produce results that have "less than half of an optical fringe per cm of wedge or lensing in a transmission interferometer test".

While Colvin et al. have note discussion of a nozzle structure & nozzle material for depositing their composition, nozzles per se are a conventional means of guiding fluid compositions such as employed by Colvin et al. to desired deposition sites, hence would have been obvious to employ for their conventional purposes. The material employed for a nozzle surface would have been dependent on the particular composition being delivered through the nozzle, which since this is essentially totally unknown in the present claims, the claim of a particular material (boron oxide) to reduce it adhesion, is particularly lacking in context & meaning, as there's no way to tell what adhesion relationship the unknown material will have with boron oxide or with any other material of which a nozzle might be made, although clearly any material have greater adhesion for some & lesser adhesion is for others. Furthermore there's no reason to suppose that even for a defined material, but all boron oxide microstructures will have "reduced adhesion". For instance, one of ordinary skill in the art would expect boron oxide-glasses, or boron oxide-containing glasses, to have significantly less resistance to flow as a surface coating, then boron oxide with a crystalline structure, such that it would have been obvious to one of ordinary skill in the art to employ typically known class structures, such as those that contain boron oxide for surfaces with reduced flow resistance are adhesion of composition, than polycrystalline or crystalline oxide protective coatings.

In discussing a typical schedule for their teachings, Colvin et al. discuss an initial mixing of the composition of the monomer & other low molecular weight components, followed by mixing the viscous oligomer into the solution until homogeneous, thereafter using the oligomer-monomer composition by deposited in a sandwich configuration between two glass plates. Colvin et al. do not have significant

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discussion with respect to their mixing apparatus & mechanisms, however it would've been obvious to one of ordinary skill in the art to employ conventional means for mixing diverse components of different viscosities, such as the techniques that employ static mixers taught by King (abstract; figures, especially 5 & 7; col. 1, lines 4-10 & 34-40; col. 2, lines 55-col. 3, lines 13; col. 4, lines 45-col. 5, lines 58) or Boatman et al. (abstract; figures, especially 2; col. 1, lines 5-35; col. 2, lines 35-46; col. 4, lines 17-65; col. 14, line 7-col. 15, lines 38). King teaches that his devices are effective for enhancing uniformity of fluids within a moving fluid stream within the confines of a conduit. Figures 5 & 7 are particularly noted to employ helical vane/tube or "element" structures graduated in size, such that the mixing conduit can be said to include "stages" (5 shown), where the size of the "elements" successively increases or decreases. Alternately, Boatman et al. also teaches a mixing process for substances of different viscosities in order to affect substantially homogeneous mixtures, including discussion of downstream additions & applicability to substances inclusive of plastic resin base materials. As illustrated in figure 2, material flows in openings 28, through segmenting means 40, then through member 42 (large elements) which causes compression of fluid mixture, followed by segment 44 where further mixing occurs (smaller elements), exiting through die 74, thus inclusive of a succession of different shaped elements that influence mixing, going from larger to smaller for the purpose of mixing different viscosity fluids homogeneously. It would've been obvious to one of ordinary skill in the art to employ the concepts as taught in either King or Boatman et al. in the process of Colvin et al., in order to mix their polymeric composition, which are taught to be inclusive of materials of higher and lower viscosity mixed together in the final mixing, since the secondary references are intended for use with just such types of disparate viscosity fluids, teaching means of affecting a homogeneous mixture, which is desired by the primary reference, thus the secondary references techniques would have been expected to be effective in the primary reference for producing an effectively mixed homogeneous composition.

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14. The teachings of Streiff et al. (5,865,537) are substantially equivalent to those of King et al. for the purpose of the above rejection, however it is noted that therein that not only do the elements in different segments (i.e. stages) become larger, but also the conduit through which the mixture of high & low viscosity fluids are being flowed in order to mix them, also changes in size with the "elements". Gussefeld (4,053,141) teaches a related construction (figures 4-5; col. 3, lines 64-col. 4, lines 23), where elements in the static mixer reside in a conical and closure progressing from larger to smaller elements, where this configuration is talked be useful when the mixing process results in a change in volume of the fluid, such that by changing the conduit cross-section a desired flow velocity may be maintained.

Other teachings of static mixers with differentiated mixing elements include: Kopp et al. (3,998,260 figures especially 7); Pinto et al. (5,938,328) is of interest for discussing the size of the elements on the mixing action; Hodan (5,137,369) with teachings on a multistage static mixer with multiple subdivisions useful for mixing polymers; and Harder (3,794,300) with teachings on the variation of size, orientation & number of mixers.

15. Claim 17 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colvin et al., in view of King as applied to claims 10-16 & 18-19 above, and further in view of Eichlseder (6,425,968 B1).

While Colvin et al. does not provide any figures of the types of holders used for holding their substrate plates & enabling the adjustment when filling the gap between them with photopolymeric material, nor particular means for delivering their compositions as taught, it would have been obvious to one of ordinary skill in the art to employ holding & dispensing means typical for processing analogous parallel substrates, where Eichlseder (abstract; cols. 4-6) teaches forming a DVD recording disk of similar structure, by employing a holding mechanism as illustrated in figures 1 & 3-6 for holding the two DVD halves & injecting UV curable adhesive 36 there between through a hole in the substrates via end portion (a nozzle) 63, which is then spread, thus providing a demonstrated effective technique that would have

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been consistent with & effective for Colvin et al.'s teachings, especially considering their noted use for techniques taught therein include recording material such as CD-ROMs (col. 1, lines 5-9+), which have substantially analogous structure to the DVDs discussed by Eichlseder. While exactly what is intended by claim 17 is significantly lacking in clarity, this combination is considered to show the obviousness of possible meanings thereof. With respect to claim 20, which is again of unclear meaning, but it is noted that various types of disks, such as CDs & DVDs may have variations in structure at their central hole, which may or may not have been additionally attachment at the central hole or hub, which might be a possible intent of claim 20 & which when the latter option is chosen would have been expected to be attached by conventional means such as UV curable adhesive, noted to be effective on materials of this type of substrates, which would have been obvious due to its expected effectiveness & efficiency.

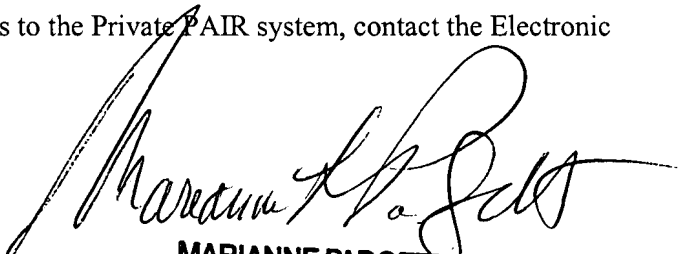
16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 8:30 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MLP/dictation software

7/11/2007 &amp; 9/29-30/2007



**MARIANNE PADGETT**  
**PRIMARY EXAMINER**